Reg. No. \_\_\_\_\_\_\_\_\_\_\_\_\_



**End Semester Examination – Nov / Dec – 2019**

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| **Code :** | **14EE2028** | **Duration :** | **3hrs** |
| **Sub. Name :** | **BUILDING AUTOMATION** | **Max. Marks :** | **100** |

**ANSWER ALL QUESTIONS (5 x 20 = 100 Marks)**

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| **Q. No.** | **Sub Div.** | **Questions** | **Course**  **Outcome** | **Marks** |
| 1. | a. | Discuss in detail the features, characteristics and drawbacks of building automation system. | CO1 | 10 |
| b. | Explain the operation of an electromagnetic relay with necessary diagrams. | CO1 | 10 |
| **(OR)** | | | | |
| 2. | a. | With relevant diagrams, explain the operation of any two sensors used in building automation system. | CO1 | 10 |
| b. | Draw and explain the construction and working of Solenoid Valve. | CO1 | 10 |
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| 3. | a. | Elaborate on the different lighting control strategies available with examples. | CO2 | 10 |
| b. | With neat sketch, explain the construction and working of Induction type Energy meter. | CO2 | 10 |
| **(OR)** | | | | |
| 4. | a. | Calculate the monthly electricity bill for a home with the following load specifications.   |  |  |  |  |  | | --- | --- | --- | --- | --- | | Sl.  No. | Name of the Load | Quantity | Wattage | Operating  Hours | | 1 | Fluorescent lamp | 4 | 40W | 6 | | 2 | Ceiling Fan | 3 | 60 W | 12 | | 3 | Refrigerator (165 L) | 1 | 100 W | 24 | | 4 | Air Conditioner | 1 | 1500 W | 6 | | 5 | Mixer | 1 | 450 W | 1 | | 6 | LED Television | 1 | 100 W | 7 |   Assume the following EB tariff.   |  |  |  |  | | --- | --- | --- | --- | | Category | Units consumed | Cost/unit  (Rs/KWh) | Fixed  Charges | | Consumption  above 500 units | 0 – 100 units | 0 | Rs.50/service | | 101 – 200 units | 3.50 | | 201 – 500 units | 4.60 | | Above 500 units | 6.60 | | CO2 | 10 |
| b. | List the consequences of poor power quality and its effects on energy consumption. | CO2 | 10 |
|  |  |  |  |  |
| 5. | a. | Explain the HVAC system as referred to building automation. | CO3 | 10 |
| b. | Describe how the HVAC systems are controlled automatically by different control strategies. | CO3 | 10 |
| **(OR)** | | | | |
| 6. | a. | Discuss on the electrical design of HVAC systems in detail. | CO3 | 10 |
| b. | Draw and explain the operation of Solenoid valve with neat sketch and its role in HVAC. | CO3 | 10 |
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| 7. | a. | With the help of a graph, explain the four fire development stages in detail. | CO3 | 10 |
| b. | Tabulate the different types of Fire and their extinguishing methods. | CO3 | 10 |
| **(OR)** | | | | |
| 8. | a. | Mention the various automatic fire detection principles and explain them briefly. | CO1 | 10 |
| b. | Point out the Do’s and Dont’s in Fire detector placement with necessary diagrams. | CO1 | 10 |
|  | | **Compulsory**: |  |  |
| 9. | a. | Draw the Door Access control model and explain its components and working of it. | CO1 | 10 |
| b. | Discuss in detail on various biometric features used for access control system. | CO1 | 10 |